



[4910-13-P]

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2012-0187; Directorate Identifier 2011-NM-094-AD]

RIN 2120-AA64

Airworthiness Directives; The Boeing Company Airplanes

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Notice of proposed rulemaking (NPRM).

SUMMARY: We propose to adopt a new airworthiness directive (AD) for certain The Boeing Company Model 757 airplanes. This proposed AD was prompted by fuel system reviews conducted by the manufacturer. This proposed AD would require modifying the fuel quantity indication system (FQIS) wiring or fuel tank systems to prevent development of an ignition source inside the center fuel tank. We are proposing this AD to prevent ignition sources inside the center fuel tank, which, in combination with flammable fuel vapors, could result in fuel tank explosions and consequent loss of the airplane.

DATES: We must receive comments on this proposed AD by [INSERT DATE 60 DAYS AFTER DATE OF PUBLICATION IN THE Federal Register].

ADDRESSES: You may send comments, using the procedures found in 14 CFR 11.43 and 11.45, by any of the following methods:

- Federal eRulemaking Portal: Go to <http://www.regulations.gov>. Follow the instructions for submitting comments.
- Fax: 202-493-2251.
- Mail: U.S. Department of Transportation, Docket Operations, M-30, West Building Ground Floor, Room W12-140, 1200 New Jersey Avenue SE., Washington, DC 20590.

- Hand Delivery: Deliver to Mail address above between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.

Examining the AD Docket

You may examine the AD docket on the Internet at <http://www.regulations.gov>; or in person at the Docket Management Facility between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The AD docket contains this proposed AD, the regulatory evaluation, any comments received, and other information. The street address for the Docket Office (phone: 800-647-5527) is in the ADDRESSES section. Comments will be available in the AD docket shortly after receipt.

FOR FURTHER INFORMATION CONTACT: Tak Kobayashi, Aerospace Engineer, Propulsion Branch, ANM-140S, FAA, Seattle Aircraft Certification Office (ACO), 1601 Lind Avenue SW., Renton, Washington 98057-3356; phone: 425-917-6499; fax: 425-917-6590; e-mail: takahisa.kobayashi@faa.gov.

SUPPLEMENTARY INFORMATION:

Comments Invited

We invite you to send any written relevant data, views, or arguments about this proposal. Send your comments to an address listed under the ADDRESSES section. Include “Docket No. FAA-2012-0187; Directorate Identifier 2011-NM-094-AD” at the beginning of your comments. We specifically invite comments on the overall regulatory, economic, environmental, and energy aspects of this proposed AD. We will consider all comments received by the closing date and may amend this proposed AD because of those comments.

We will post all comments we receive, without change, to <http://www.regulations.gov>, including any personal information you provide. We will also post a report summarizing each substantive verbal contact we receive about this proposed AD.

Discussion

The FAA has examined the underlying safety issues involved in fuel tank explosions on several large transport airplanes, including the adequacy of existing regulations, the service history of airplanes subject to those regulations, and existing maintenance practices for fuel tank systems. As a result of those findings, we issued a regulation titled “Transport Airplane Fuel Tank System Design Review, Flammability Reduction and Maintenance and Inspection Requirements” (66 FR 23086, May 7, 2001). In addition to new airworthiness standards for transport airplanes and new maintenance requirements, this rule included Special Federal Aviation Regulation No. 88 (“SFAR 88,” Amendment 21-78, and subsequent Amendments 21-82 and 21-83).

Among other actions, SFAR 88 requires certain type design (i.e., type certificate (TC) and supplemental type certificate (STC)) holders to substantiate that their fuel tank systems can prevent ignition sources in the fuel tanks. This requirement applies to type design holders for large turbine-powered transport airplanes and for subsequent modifications to those airplanes. It requires them to perform design reviews and to develop design changes and maintenance procedures if their designs do not meet the new fuel tank safety standards. As explained in the preamble to the rule, we intended to adopt airworthiness directives to mandate any changes found necessary to address unsafe conditions identified as a result of these reviews.

In evaluating these design reviews, we have established four criteria intended to define the unsafe conditions associated with fuel tank systems that require corrective actions. The percentage of operating time during which fuel tanks are exposed to flammable conditions is one of these criteria. The other three criteria address the failure types under evaluation: single failures, a combination of failures, and unacceptable service (failure) experience. For all four criteria, the evaluations included consideration of previous actions taken that may mitigate the need for further action.

We have determined that the actions identified in this proposed AD are necessary to reduce the potential of ignition sources inside the center fuel tank, which has been identified to have a high flammability exposure. Ignition sources inside the center fuel tank, in combination with flammable fuel vapors, could result in fuel tank explosions and consequent loss of the airplane.

The combination of a latent failure within the center fuel tank and a subsequent single failure of the fuel quantity indicating system (FQIS) wiring or components outside the fuel tank can cause development of an ignition source inside the center fuel tank. Latent in-tank failures, including corrosion/deposits at wire terminals, conductive debris on fuel system probes, wires or probes contacting the tank structure, and wire faults, could create a conductive path inside the center fuel tank. Out-tank single failures including hot shorts in airplane wiring and/or the FQIS processor could result in electrical energy being transmitted into the center fuel tank via the FQIS wiring. The electrical energy, if combined with a latent in-tank failure, could be sufficient to create an ignition source inside the center fuel tank, which, combined with flammable fuel vapors could result in a catastrophic fuel tank explosion.

SFAR 88 and Fuel Tank Flammability Reduction Rule

The National Transportation Safety Board (NTSB) determined that the combination of a latent failure inside the center fuel tank and a subsequent single failure of the FQIS wiring or components outside the fuel tank was the most likely ignition source inside the center fuel tank that resulted in the TWA Flight 800 explosion. After the TWA 800 accident, we issued AD 99-03-04, Amendment 39-11018 (64 FR 4959, February 2, 1999), and AD 98-20-40, Amendment 39-10808 (63 FR 52147, September 30, 1998), mandating separation of the FQIS wiring that penetrates the fuel tank from high power wires and circuits on the classic Boeing 737 and 747 airplanes. Those ADs resulted in installation of Transient Suppression Units (TSUs), Transient Suppression

Devices (TSDs), or Isolated Fuel Quantity Transmitter (IFQT) as a method of compliance with the AD requirements.

After we issued those ADs, the findings from the SFAR 88 review showed that most transport category airplanes with high flammability fuel tanks needed TSUs, TSDs, or IFQTs to prevent electrical energy from entering the fuel tanks via the FQIS wiring in the event of a latent failure in combination with a single failure.

Installation of those FQIS protection devices, however, was determined unnecessary on those airplanes that are required to comply with the “Reduction of Fuel Tank Flammability in Transport Category Airplanes” rule (73 FR 42444, July 21, 2008), referred to as the Fuel Tank Flammability Reduction (FTFR) rule. The FTFR rule requires incorporation of a flammability reduction means (FRM) that converts high flammability fuel tanks into low flammability fuel tanks for certain airplane models. Therefore, the unsafe condition identified by SFAR 88 is mitigated by incorporation of an FRM, as discussed in the FTFR rule.

This proposed AD is intended to address the unsafe condition associated with the FQIS wiring that penetrates the center fuel tank for all Boeing Model 757 airplanes that are not subject to the requirements of the FTFR rule. This proposed AD would apply to airplanes operated in all-cargo service and airplanes operated under Title 14 Code of Federal Regulations (CFR) part 91, since those airplanes are not subject to the requirements of the FTFR rule. Also, this proposed AD would apply to airplanes for which the State of Manufacture issued the original certificate of airworthiness or export airworthiness approval prior to January 1, 1992, since those airplanes are also not subject to the requirements of the FTFR rule. However, as explained in paragraph 2-5.a. of Advisory Circular 120-98, “Operator Requirements for Incorporation of Fuel Tank Flammability Reduction Requirements,” dated May 7, 2009, to operate a pre-1992 airplane in passenger service after December 26, 2017, operators must incorporate an

FRM that meets the requirements of §26.33(c) before that date. For such airplanes on which an FRM is incorporated, further compliance with this proposed AD is not required.

The nitrogen generating system (NGS) being developed by Boeing to meet the FTFR rule addresses the unsafe condition of this AD, as well as providing other safety improvements. Paragraph (h) of this proposed AD provides that, for operators not required to comply with the FTFR rule, electing to comply with the FTFR rule would be an acceptable method of addressing the unsafe condition.

As discussed in the FTFR rule, the FAA recognized that separate airworthiness actions would be initiated to address the remaining fuel system safety issues for airplanes for which an FRM is not required. We have notified design approval holders that service instructions to support introduction of FQIS protection are now necessary for fuel tanks that are not required to be modified with an FRM by the FTFR rule. To date we have not received any service information from Boeing addressing this specific threat; therefore, we are proceeding with this proposal, which would require modifications using methods approved by the Manager of the Seattle Aircraft Certification Office.

We plan similar actions for those Boeing and Airbus airplanes with similar FQIS vulnerabilities that are not affected by the FTFR rule.

FAA's Determination

We are proposing this AD because we evaluated all the relevant information and determined the unsafe condition described previously is likely to exist or develop in other products of the same type design.

Proposed AD Requirements

This proposed AD would require modifying the FQIS wiring or fuel tank systems to prevent development of an ignition source inside the center fuel tank.

Costs of Compliance

We estimate that this proposed AD affects 352 airplanes of U.S. registry. We have been advised that some of those airplanes are subject to the requirements of the FTFR rule and therefore are excluded from the requirements of this AD.

Because the manufacturer has not yet developed a modification commensurate with the actions specified by this proposed AD, we cannot provide specific information regarding the required number of work hours or the cost of parts to do the proposed modification. In addition, modification costs will likely vary depending on the operator and the airplane configuration. The proposed compliance time of 60 months should provide ample time for the development, approval, and installation of an appropriate modification.

Based on similar modifications, however, we can provide some estimated costs for the proposed modification in this NPRM. The modifications mandated by AD 99-03-04, Amendment 39-11018 (64 FR 4959, February 2, 1999), and AD 98-20-40, Amendment 39-10808 (63 FR 52147, September 30, 1998), for the classic Boeing Model 737 and 747 airplanes (i.e., TSD, TSU, IFQT) are not available for Boeing Model 757 airplanes. But, based on the costs associated with those modifications, we estimate the cost of this new proposed modification to be no more than \$100,000 per airplane. The Honeywell FQIS may need additional modifications, which may cost as much as \$100,000 per airplane. The cost impact of the proposed AD therefore is estimated to be between \$100,000 and \$200,000 per airplane.

As indicated earlier in this preamble, we specifically invite the submission of comments and other data regarding the costs of this proposed AD.

Authority for this Rulemaking

Title 49 of the United States Code specifies the FAA's authority to issue rules on aviation safety. Subtitle I, section 106, describes the authority of the FAA Administrator.

Subtitle VII: Aviation Programs, describes in more detail the scope of the Agency's authority.

We are issuing this rulemaking under the authority described in Subtitle VII, Part A, Subpart III, Section 44701: "General requirements." Under that section, Congress charges the FAA with promoting safe flight of civil aircraft in air commerce by prescribing regulations for practices, methods, and procedures the Administrator finds necessary for safety in air commerce. This regulation is within the scope of that authority because it addresses an unsafe condition that is likely to exist or develop on products identified in this rulemaking action.

Regulatory Findings

We determined that this proposed AD would not have federalism implications under Executive Order 13132. This proposed AD would not have a substantial direct effect on the States, on the relationship between the national Government and the States, or on the distribution of power and responsibilities among the various levels of government.

For the reasons discussed above, I certify this proposed regulation:

- (1) Is not a "significant regulatory action" under Executive Order 12866,
- (2) Is not a "significant rule" under the DOT Regulatory Policies and Procedures (44 FR 11034, February 26, 1979),
- (3) Will not affect intrastate aviation in Alaska, and
- (4) Will not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act.

List of Subjects in 14 CFR Part 39

Air transportation, Aircraft, Aviation safety, Incorporation by reference, Safety.

The Proposed Amendment

Accordingly, under the authority delegated to me by the Administrator, the FAA proposes to amend 14 CFR part 39 as follows:

PART 39 - AIRWORTHINESS DIRECTIVES

1. The authority citation for part 39 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701.

§ 39.13 [Amended]

2. The FAA amends § 39.13 by adding the following new airworthiness directive (AD):

The Boeing Company: Docket No. FAA-2012-0187; Directorate Identifier 2011-NM-094-AD.

(a) Comments Due Date

We must receive comments by [INSERT DATE 60 DAYS AFTER DATE OF PUBLICATION IN THE Federal Register].

(b) Affected ADs

None.

(c) Applicability

This AD applies to The Boeing Company Model 757-200, -200PF, -200CB, and -300 series airplanes; certificated in any category; for which compliance with 14 CFR 121.1117(d), 125.509(d), or 129.117(d) is not required; regardless of the date of issuance of the original certificate of airworthiness or export airworthiness approval.

(d) Subject

Joint Aircraft System Component (JASC)/Air Transport Association (ATA) of America Code 7397: Engine fuel system wiring.

(e) Unsafe Condition

This AD was prompted by fuel system reviews conducted by the manufacturer. We are issuing this AD to prevent development of an ignition source inside the center fuel tank caused by a latent in-tank failure combined with electrical energy transmitted into the center fuel tank via the fuel quantity indicating system (FQIS) wiring due to a single out-tank failure.

(f) Compliance

Comply with this AD within the compliance times specified, unless already done.

(g) Modification

Within 60 months after the effective date of this AD, modify the FQIS wiring or fuel tank systems to prevent development of an ignition source inside the center fuel tank, in accordance with a method approved by the Manager, Seattle Aircraft Certification Office (ACO), FAA.

Note 1 to paragraph (g) of this AD: After accomplishment of the actions required by paragraph (g) of this AD, maintenance and/or preventive maintenance under 14 CFR part 43 is permitted provided the maintenance does not result in changing the AD-mandated configuration (reference 14 CFR 39.7).

(h) Optional Installation of Flammability Reduction Means

As an alternative to the requirements of paragraph (g) of this AD, operators may elect to comply with the requirements of 14 CFR 121.1117 or 14 CFR 125.509 or 14 CFR 129.117 (not including the exclusion of cargo airplanes in Sections 121.1117(j), 129.117(j), and 125.509(j)). Following this election, failure to comply with Sections 121.1117, 129.117, and 125.509 is a violation of this AD.

(i) Alternative Methods of Compliance (AMOCs)

(1) The Manager, Seattle ACO, FAA, has the authority to approve AMOCs for this AD, if requested using the procedures found in 14 CFR 39.19. In accordance with 14

CFR 39.19, send your request to your principal inspector or local Flight Standards District Office, as appropriate. If sending information directly to the manager of the ACO, send it to the attention of the person identified in the Related Information section of this AD. Information may be e-mailed to: 9-ANM-Seattle-ACO-AMOC-Requests@faa.gov.

(2) Before using any approved AMOC, notify your appropriate principal inspector, or lacking a principal inspector, the manager of the local flight standards district office/certificate holding district office.

(j) Related Information

For more information about this AD, contact Tak Kobayashi, Aerospace Engineer, Propulsion Branch, ANM-140S, FAA, Seattle Aircraft Certification Office (ACO), 1601 Lind Avenue SW., Renton, Washington 98057-3356; phone: 425-917-6499; fax: 425-917-6590; e-mail: takahisa.kobayashi@faa.gov.

Issued in Renton, Washington, on February 21, 2012.

Ali Bahrami,
Manager,
Transport Airplane Directorate,
Aircraft Certification Service.

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